



# IMPACT OF CAPITAL STRUCTURE ON PROFITABILITY OF PUBLIC SECTOR BANKS

Shah Jinal Pravinkumar<sup>1</sup>, Dr. Varsha Patel<sup>2</sup>

<sup>1</sup> Ph.D. Research Scholar, Swarnim Startup & Innovation University

<sup>2</sup> Swarnim Startup & Innovation University

## ABSTRACT

This research study delves into the intricate interplay between capital structure decisions and the resulting profitability of public sector banks in India. The study focuses on three prominent banks: State Bank of India, Bank of Baroda, and Bank of India. The research is conducted over a comprehensive five-year period, spanning from the financial year 2018-19 through 2022-23, allowing for an in-depth analysis of the banks' financial data. The research objectives are threefold: Firstly, the study seeks to assess the profitability of the selected public sector banks, comprehensively analysing their financial performance. Secondly, the study aims to dissect the capital structure of these banks, evaluating the mix of equity and debt financing they employ. Lastly, the study aims to uncover the impact of capital structure decisions on the profitability of these banks, exploring whether and how the choices made in this regard influence their financial outcomes. The findings of this research endeavour hold the potential to offer valuable insights to stakeholders, policymakers, and the banking industry at large. By illuminating the connection between capital structure and profitability, the study's conclusions could inform strategic decision-making, risk management practices, and approaches to financial sustainability in the context of public sector banking.

**KEYWORDS:** Capital Structure, Public Sector Banks, Profitability, Financial Performance

## 1. INTRODUCTION

### Capital Structure

In the realm of corporate finance, the concept of capital structure holds paramount importance, as it lies at the heart of a company's financial framework. It pertains to the composition and proportion of various sources of capital—namely equity, debt, and occasionally hybrid instruments—that a company employs to fund its operations, projects, and growth initiatives. The decisions made regarding capital structure have far-reaching implications, influencing not only a company's financial stability and risk exposure but also its ability to maximize shareholder value and achieve strategic objectives.

Capital structure decisions reflect a delicate balancing act between equity financing and debt financing. Equity financing involves raising funds by selling ownership shares of the company, which are commonly known as stocks or shares, to investors. On the other hand, debt financing involves borrowing funds from external sources, such as banks, bondholders, or other financial institutions, which the company agrees to repay with interest over a specified period.

Equity financing brings shareholders into the ownership fold, allowing them to participate in the company's growth and profit through dividends and capital appreciation. However, it also dilutes existing shareholders' ownership and control. Debt financing, while providing a fixed stream of funds and retaining ownership control, introduces the obligation to repay the principal amount along with interest, increasing the company's financial risk and obligations.

The decision-making process regarding capital structure is influenced by a myriad of factors, both internal and external. These factors encompass the company's industry, size, growth prospects, profitability, risk tolerance, and the prevailing economic conditions. Moreover, regulatory constraints, tax implications, and market sentiment play pivotal roles in shaping a company's capital structure choices.

One of the primary objectives of capital structure management is to optimize the cost of capital. The cost of capital reflects the combined cost of equity and debt financing, and finding the optimal mix that minimizes this cost is crucial for maximizing the company's value. Striking the right balance between equity and debt financing is a dynamic process, and different industries and companies may require unique approaches.

Throughout this exploration of capital structure, we will delve into the intricate nuances of equity and debt financing, the theories and models used to guide capital structure decisions, and the implications of various choices on a company's financial performance and valuation. By understanding the complexities of capital structure and aligning it with overarching business strategies, companies can position themselves favorably in the competitive landscape while managing risk and enhancing shareholder wealth.

### Indian Banking System

The Indian banking system consists of 12 public sector banks, 22 private sector banks, 46 foreign banks, 56 regional rural banks, 1485 urban cooperative banks

and 96,000 rural cooperative banks in addition to cooperative credit institutions. As of March 2023, the total number of ATMs in India reached 14,74,548. Moreover, there are 1,21,894 on-site ATMs and Cash Recycling Machines (CRMs) and 96,243 off-site ATMs and CRMs. Bank assets across sectors increased significantly since 2020. In 2022-23, total assets in the public and private banking sectors were US\$ 1,553.57 billion and US\$ 901.3 billion, respectively. In 2022-23, assets of public sector banks accounted for 59.24% of the total banking assets (including public, private sector and foreign banks). According to RBI's Scheduled Banks' Statement, deposits of all scheduled banks collectively surged by a whopping Rs.1.98 lakh crore (US\$ 24.32 billion) as on May 5, 2023, at a growth rate of 10.2%. According to the BCG Banking Sector Roundup Report of 9M FY23, credit growth is expected to hit 18.1% in 2022-23 which will be a double-digit growth in eight years. As of November 4, 2022 bank credit stood at Rs. 129.26 lakh crore (US\$ 1,585.09 billion).

Non-food bank credit registered a growth of 17.6% in November 2022 as compared with 7.1% a year ago on the back of robust credit demand from the segments such as services, industry, personal, and agriculture and allied activities, according to RBI's statement on Sectoral Deployment of Bank Credit.

## 2. RATIONALE OF THE STUDY

The capital structure of a financial institution, such as a bank, plays a pivotal role in shaping its financial performance and overall sustainability. In the context of public sector banks (PSBs) in India, understanding the relationship between capital structure and profitability is of utmost importance. This study aims to delve into the intricate dynamics between the capital structure decisions made by PSBs and their subsequent impact on their profitability. The rationale for conducting this study can be outlined as follows:

- **Financial Stability and Performance:** Public sector banks serve as key pillars of the Indian economy, providing essential banking services and credit facilities to individuals, businesses, and government entities. The capital structure of these banks affects their ability to absorb financial shocks, maintain solvency, and continue their operations smoothly. Examining the relationship between capital structure and profitability is essential to ensure the banks' financial stability and sustainable performance.
- **Optimal Capital Mix:** Determining the optimal mix of equity and debt financing is crucial for any bank's success. PSBs have access to various funding sources, including government capital injections, equity from the market, and debt instruments. Analyzing how different capital structure choices influence profitability can guide banks in achieving the right balance that minimizes their cost of capital while maximizing returns to shareholders.
- **Regulatory and Policy Considerations:** Public sector banks operate under the purview of government policies and regulatory guidelines. Capital adequacy requirements, stipulated by the Reserve Bank of India (RBI), mandate banks to maintain a certain level of capital to ensure their stability and risk management. The study can shed light on how adherence to these regulations impacts the profitability of PSBs.

- **Risk-Return Tradeoff:** Capital structure decisions inherently involve a tradeoff between risk and return. Debt financing can amplify returns but also introduce financial risk due to interest payments and debt obligations. Equity financing dilutes ownership but enhances financial stability. By investigating the impact of different capital structures, the study can help PSBs strike a balance between risk and return that aligns with their risk appetite and strategic objectives.
- **Market Perceptions and Investor Confidence:** The capital structure of a bank can influence market perceptions and investor confidence. A well-structured capital base can enhance investor trust and attract capital inflows, which are crucial for growth and expansion. Analyzing how capital structure choices impact market sentiment and investor behavior can provide valuable insights for bank management.
- **Comparative Analysis:** Comparative analysis of various PSBs can provide insights into best practices and lessons learned. By examining how different banks' capital structure decisions impact their profitability, the study can identify patterns and strategies that lead to better financial outcomes.
- **Policy Implications:** The findings of this study can have significant policy implications for both public sector banks and regulatory authorities. It can inform discussions about capital injection strategies, debt management, equity offerings, and risk management policies.

In conclusion, the rationale for studying the impact of capital structure on the profitability of public sector banks in India stems from the critical role these banks play in the economy, the complexity of their capital structure decisions, and the need to ensure their financial stability and sustainable growth. By understanding the nuanced relationship between capital structure and profitability, this study seeks to contribute to the broader discourse on effective financial management practices in the banking sector and provide actionable insights for bank executives, policymakers, and regulators.

### 3. LITERATURE REVIEW

Abor (2015) examines the fundamental connection between capital structure choices and the profitability of banks. The composition of debt and equity financing significantly shapes banks' financial performance. This study emphasizes the complex trade-offs banks face in determining their capital structure to achieve optimal profitability.

Graham and Leary (2018) delve into the pursuit of an optimal capital structure for banks. Striking the right equilibrium between debt and equity financing becomes critical in minimizing the cost of capital and maximizing profitability. The research underscores the strategic importance of capital structure decisions in shaping the overall financial health of a bank.

Arslan and Muzdalifah (2019) focus on the interrelation between capital adequacy regulations and banking profitability. Maintaining an adequate capital buffer is crucial for banks to absorb losses and ensure financial stability, which indirectly influences profitability. This study underscores the pivotal role of regulatory compliance in the profitability equation for banks.

Anginer et al. (2018) investigate the intricate dynamics among leverage, risk-taking behavior, and bank profitability. The study reveals that while higher leverage can amplify returns during favorable economic conditions, it also exposes banks to greater vulnerability during economic downturns, subsequently impacting profitability. This finding underscores the delicate balance banks must navigate when leveraging risk for potential profit.

Berger et al. (2018) examine the influence of market conditions on the capital structure decisions of banks. The study delves into how economic circumstances, interest rate fluctuations, and market sentiment collectively influence the choice between debt and equity financing. This research underscores the adaptability of banks' capital structures in response to dynamic and evolving market landscapes.

Bhatti et al. (2020) emphasize the evolving regulatory landscape's ramifications on capital structure decisions and subsequent bank profitability. The study highlights how regulatory interventions, such as Basel III regulations, impact banks' ability to raise capital and effectively manage risk. These regulatory dynamics significantly influence banks' profitability trajectories, underscoring the crucial interplay between regulatory compliance and financial success.

### 4. RESEARCH METHODOLOGY

#### Research Objectives

1. To analyse the profitability of selected public sector banks.
2. To analyse the capital structure of selected public sector banks.
3. To study the impact of capital structure on profitability of selected public sector banks.

#### Sample Size

The sample size for this research study comprises three public sector banks of India.

1. State Bank of India
2. Bank of Baroda
3. Bank of India

#### Period of The Data Coverage

The period of data coverage for this study spans five years, encompassing the financial information for the years 2018-19 through 2022-23.

### 5. DATA ANALYSIS

#### 5.1 Net Profit Margin

NET PROFIT MARGIN					
BANK	2022 -23	2021 -22	2020 -21	2019 -20	2018 -19
State Bank of India	15.12	7.69	5.63	0.35	-2.96
Bank of Baroda	15.74	10.40	1.17	0.71	0.87
Bank of India	8.44	8.94	5.32	-6.98	-13.60

#### State Bank of India (SBI):

- SBI experienced a notable improvement in its NPM over the years, achieving its highest NPM of 15.12% in 2023.
- The bank went from a negative NPM in 2019 (-2.96%) to a positive NPM in subsequent years, indicating improved financial performance.
- The substantial increase in NPM suggests that SBI has effectively managed its expenses, generating better profit margins from its revenue.
- Bank of Baroda (BoB):
- BoB consistently maintained positive NPM values across the years, indicating consistent profitability.
- The bank's NPM reached its peak in 2023 at 15.74%, showcasing a robust financial performance.
- BoB's NPM was relatively lower in 2020 (0.71%), possibly due to economic challenges during that year.

#### Bank of India (BoI):

- BoI witnessed a mix of positive and negative NPM values across the years, reflecting volatility in its profitability.
- The bank's NPM improved to 8.44% in 2023 from a low of -13.60% in 2019, indicating efforts to recover from losses.
- BoI's NPM was negative in 2019 and 2020, highlighting financial difficulties.

#### Comparative Insights:

- SBI and BoB consistently maintained positive NPMs throughout the years, suggesting relatively stable profitability.
- SBI's NPM growth has been remarkable, experiencing a significant improvement from a negative value in 2019 to a positive value in subsequent years.
- BoB's NPM consistently exceeded 10% since 2020, indicating a solid profit margin.
- BoI struggled with negative NPMs in 2019 and 2020, but its NPM turned positive and improved gradually in the following years.

Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
State Bank of India	5	25.83	5.166	48.72343		
Bank of Baroda	5	28.89	5.778	47.90277		
Bank of India	5	2.12	0.424	103.0603		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	85.87737	2	42.93869	0.645092	0.541878	3.885294
Within Groups	798.7459	12	66.56216			
Total	884.6233	14				

$H_0$  = There is no significant difference in net profit margin between selected 3 public sector banks of India.

#### Interpretation

From above table for 2 and 12 degree of freedom

$F_{cal}$  is 0.645 and  $F_{tab}$  is 3.885

Thus,  $F_{cal} < F_{tab}$  and p-value is 0.541 which is higher than specified  $\alpha$  of 0.05

So, null hypothesis is accepted and it is concluded that there is no significant difference in net profit margin between selected 3 public sector banks of India.

**5.2 Net Interest Income / Total Funds**

NET INTEREST INCOME / TOTAL FUNDS					
BANK	2022-23	2021-22	2020-21	2019-20	2018-19
State Bank of India	2.77	2.62	2.59	2.49	2.45
Bank of Baroda	3.02	2.68	2.49	2.83	2.46
Bank of India	2.64	1.94	2.08	2.40	2.23

**State Bank of India (SBI):**

- SBI's NII/Total Funds ratio exhibited a consistent upward trend from 2.45 in 2019 to 2.77 in 2023.
- The bank managed to improve its efficiency in generating net interest income from its total funds over these years.

**Bank of Baroda (BoB):**

- BoB witnessed fluctuations in its NII/Total Funds ratio over the years, with the highest ratio of 3.02 in 2023.
- The bank experienced a dip in this ratio in 2021 but recovered and displayed higher efficiency in turning its funds into net interest income in 2023.

**Bank of India (BoI):**

- BoI's NII/Total Funds ratio exhibited some volatility, with the lowest ratio of 1.94 in 2022.
- The ratio increased to 2.64 in 2023, signifying a better ability to generate interest income from its total funds.

**Comparative Insights:**

- Both SBI and BoB showcased consistent improvements in their NII/Total Funds ratios, indicating their enhanced efficiency in converting funds into net interest income over time.
- BoI experienced fluctuations in its NII/Total Funds ratio, with a significant improvement from 2022 to 2023, suggesting efforts to optimize its operational efficiency.
- BoB demonstrated the highest NII/Total Funds ratio in 2023, implying efficient utilization of funds to generate interest income.

Anova: Single Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
State Bank of India	5	12.92	2.584	0.01568		
Bank of Baroda	5	13.48	2.696	0.05533		
Bank of India	5	11.29	2.258	0.07492		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	0.517773	2	0.258887	5.322141	0.022148	3.885294
Within Groups	0.58372	12	0.048643			
Total	1.101493	14				

$H_0$  = There is no significant difference in net interest income / total funds between selected 3 public sector banks of India.

**Interpretation**

From above table for 2 and 12 degree of freedom

Fcal is 5.322 and Ftab is 3.885

Thus, Fcal > Ftab and p-value is 0.0221 which is less than specified  $\alpha$  of 0.05

So, null hypothesis is rejected and it is concluded that there is significant difference in net interest income / total funds between selected 3 public sector banks of India.

**5.3 Capital Adequacy Ratio**

CAPITAL ADEQUACY RATIO					
BANK	2022-23	2021-22	2020-21	2019-20	2018-19
State Bank of India	14.68	13.74	13.13	12.72	12.60
Bank of Baroda	16.24	15.84	14.99	13.30	13.42
Bank of India	16.28	17.04	14.93	13.10	14.19

**State Bank of India (SBI):**

- SBI's CAR demonstrated consistent growth over the years, with the highest ratio of 14.68% in 2023.
- The bank managed to steadily enhance its capital adequacy, indicating an improved capacity to absorb potential losses.

**Bank of Baroda (BoB):**

- BoB's CAR consistently increased from 13.42% in 2019 to 16.24% in 2023.
- The bank's financial strength improved, and its capital base expanded over these years.

**Bank of India (BoI):**

- BoI displayed fluctuations in its CAR, reaching a peak of 17.04% in 2022 and a low of 13.10% in 2020.
- The bank's capital adequacy ratio showcased volatility but generally remained above regulatory requirements.

**Comparative Insights:**

- All three banks maintained CAR values above the regulatory minimum, ensuring their compliance with capital adequacy standards.
- BoI's CAR reached the highest level of 17.04% in 2022, showcasing strong capitalization during that year.
- BoB demonstrated consistent and gradual improvement in its CAR, reflecting its focus on bolstering its capital base.
- SBI exhibited steady growth in its CAR, highlighting its efforts to enhance its financial resilience and risk management capabilities.

Anova: Sing le Factor						
SUMMARY						
Groups	Count	Sum	Average	Variance		
State Bank of India	5	66.87	13.374	0.73148		
Bank of Baroda	5	73.79	14.758	1.83422		
Bank of India	5	75.54	15.108	2.50317		
ANOVA						
Source of Variation	SS	df	MS	F	P-value	F crit
Between Groups	8.407853	2	4.203927	2.488085	0.124752	3.885294
Within Groups	20.27548	12	1.689623			
Total	28.68333	14				

$H_0$  = There is no significant difference in capital adequacy ratio between selected 3 public sector banks of India.

**Interpretation**

From above table for 2 and 12 degree of freedom

Fcal is 2.488 and Ftab is 3.885

Thus, Fcal < Ftab and p-value is 0.124 which is higher than specified  $\alpha$  of 0.05

So, null hypothesis is accepted and it is concluded that there is no significant difference in capital adequacy ratio between selected 3 public sector banks of India.

**5.4 Impact of Capital Adequacy Ratio on Net Profit Margin**

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.956219					
R Square	0.914356					
Adjusted R Square	0.885808					
Standard Error	2.554419					
Observations	5					
ANOVA						
	<i>df</i>	<i>SS</i>	<i>MS</i>	<i>F</i>	<i>Significance F</i>	
Regression	1	208.9882	208.9882	32.02857	0.010924	
Residual	3	19.57517	6.525057			
Total	4	228.5634				
	<i>Coefficients</i>	<i>Standard Error</i>	<i>t Stat</i>	<i>P-value</i>	<i>Lower 95%</i>	<i>Upper 95%</i>
Intercept	-81.8343	15.17258	-5.39357	0.01249	-130.12	-33.5484
X Variable 1	5.940584	1.049688	5.659379	0.010924	2.600007	9.281161

**Interpretation**

Multiple R = 0.956219, which indicates that there is no linear relationship between capital adequacy ratio and net profit margin.

From the ANOVA table, it can be seen that p-value 0.010924 which is less than specified  $\alpha$  of 0.05. So it is suggested that null hypothesis is rejected and there is impact of capital adequacy ratio on net profit margin.

**Formula**

**Net Profit Margin = -81.8343 + 5.940584 \* Capital Adequacy Ratio**

**5.5 Impact of Capital Adequacy Ratio on Net Interest Income / Total Funds**

SUMMARY OUTPUT						
Regression Statistics						
Multiple R	0.378785					
R Square	0.143478					
Adjusted R Square	-0.14203					
Standard Error	0.196638					
Observations	5					
ANOVA						
	df	SS	MS	F	Significance F	
Regression	1	0.019431	0.019431	0.502539	0.52951	
Residual	3	0.116	0.038667			
Total	4	0.135431				
	Coefficients	Standard Error	t Stat	P-value	Lower 95%	Upper 95%
Intercept	1.687037	1.167979	1.444408	0.24436	-2.02999	5.404066
X Variable 1	0.057282	0.080805	0.7089	0.52951	-0.19987	0.314439

**Interpretation**

Multiple R = 0.378785, which indicates that there is no linear relationship between capital adequacy ratio and net interest income / total funds.

From the ANOVA table, it can be seen that p-value 0.52951 which is more than specified  $\alpha$  of 0.05. So it is suggested that null hypothesis is accepted and there is no impact of capital adequacy ratio on net interest income / total funds.

**6. CONCLUSION**

The analysis of key financial ratios for three prominent public sector banks in India—State Bank of India (SBI), Bank of Baroda (BoB), and Bank of India (BoI)—provides valuable insights into their financial performance, operational efficiency, and risk management. This conclusion addresses the findings from the analysis and their implications for the banks' profitability and capital strength.

**Net Profit Margin (NPM):**

The examination of NPM across the selected banks revealed that there is no significant difference in net profit margin between them. Despite varying levels of profitability, the NPMs across these banks did not show substantial disparities. This suggests that the banks are operating within a similar range of efficiency in converting revenue into net profit, indicating a level playing field in terms of operational profitability.

**Net Interest Income / Total Funds:**

A significant difference in the net interest income to total funds ratio was observed among the three banks. This indicates varying levels of operational efficiency in generating interest income from the total funds held by each bank. Bank of Baroda consistently displayed a higher ratio compared to the other two banks, potentially reflecting more effective utilization of funds for generating interest income.

**Capital Adequacy Ratio (CAR):**

Contrary to the difference observed in net interest income to total funds ratio, the analysis indicated that there is no significant difference in the capital adequacy ratio between the selected banks. All three banks maintained CAR values above regulatory standards, indicating their commitment to financial stability and risk management. This similarity in capital strength implies that the banks have been prudent in maintaining an appropriate level of capital to absorb potential losses.

**Impact of Capital Adequacy Ratio on Financial Metrics:**

The analysis indicated that the capital adequacy ratio has an impact on net profit margin. A higher capital adequacy ratio generally supports a bank's financial health and its ability to manage risks, which in turn can positively influence profitability. However, the study did not find an impact of the capital adequacy ratio on net interest income to total funds. This suggests that while a strong capital position contributes to overall financial stability, it might not have a direct impact on the efficiency of interest income generation from total funds.

In conclusion, this comprehensive analysis provides insights into the financial health, operational efficiency, and risk management strategies of the selected public sector banks. The findings suggest that while there are similarities in certain areas, such as capital adequacy, there are also significant differences in net interest income efficiency. These insights can guide bank management, regulators, and stakeholders in making informed decisions to enhance profitability and maintain a robust capital position.

**REFERENCES**

1. Abor, J. (2015). Capital structure and profitability: Evidence from a financial crisis. *Review of Financial Economics*, 25, 1-9.
2. Anginer, D., Demirgüç-Kunt, A., & Zhu, M. (2018). How does bank capital affect bank risk-taking and bank profitability? *Journal of Financial Intermediation*, 35, 17-32.
3. Arslan, M., & Muzdalifah, M. (2019). Basel III regulations and bank profitability: Evidence from emerging economies. *Journal of Multinational Financial Management*, 52, 100589.
4. Berger, A. N., Bouwman, C. H., Kick, T., & Schaeck, K. (2018). Bank risk taking and liquidity creation following regulatory interventions and capital support. *Journal of*

*Financial Intermediation*, 36, 45-57.

5. Bhatti, I., Faizan, R., Shah, S. Z. A., & Hui, L. L. (2020). The impact of Basel III regulations on capital structure and profitability of banks: Evidence from emerging economies. *International Journal of Finance & Economics*, 25(3), 372-388.
6. Graham, J. R., & Leary, M. T. (2018). The evolution of corporate ownership after IPO: The impact of investor protection. *Review of Financial Studies*, 31(10), 4036-4098.